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Nevada Test Site

ANNUAL SITE ENVIRONMENTAL REPORT FOR CALENDAR YEAR - 1999

October 2000

Prepared by Bechtel Nevada
Post Office Box 98521 • Las Vegas, NV 89193-8521

Prepared for U.S. Department of Energy
Nevada Operations Office

Contract No. DE-AC08-96NV11718

Bechtel Nevada

DISCLAIMER

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Editors: Yvonne E. Townsend and Robert F. Grossman

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FOREWORD

Prior to 1989, annual reports of environmental monitoring and assessment results for the Nevada Test Site (NTS) were prepared in two separate parts. Onsite effluent monitoring and environmental monitoring results were reported in an onsite report prepared by the U.S. Department of Energy, Nevada Operations Office (DOE/NV). Results of the Offsite Radiological Surveillance and Long-Term Hydrological Monitoring programs conducted by the U.S. Environmental Protection Agency's (EPA's) Laboratory (various names) in Las Vegas, Nevada, were reported separately by that Agency.

Beginning with the 1989 Annual Site Environmental Report for the NTS, these two documents were combined into a single report to provide a more comprehensive annual documentation of the environmental protection activities conducted for the nuclear testing program and other nuclear and non-nuclear operations at the NTS. The two agencies have coordinated preparation of this eleventh combined onsite and offsite report through sharing of information on environmental surveillance and releases as well as meteorological, hydrological, and other supporting data used in dose-estimation calculations.

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The skill, dedication, and perseverance of Angela L. McCurdy in text processing and graphics support were crucial to the production of this report. Also, very crucial to the production of this report was the graphics support provided by John R. Coffey of the Geographical Information System Group. The review and advice offered by the DOE/NV's Environment, Safety and Health Division (ESHD) and the EPA's Radiation & Indoor Environments National Laboratory, Las Vegas (R&IE-LV) reviewers were invaluable. The efforts of Robert Furlow in coordinating the review of the 1999 ASER by the ESHD are greatly appreciated. Compilation and verification of onsite data were provided by Robert F. Grossman and Robert R. Kinnison. Statistical analyses of data were provided by Robert R. Kinnison. The cooperative support of Terry L. Mouck of the R&IE-LV in production of this combined onsite and offsite environmental report is greatly appreciated.

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TABLE OF CONTENTS

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LIST OF FIGURES

List of Figures, cont. *Page*

LIST OF TABLES

List of Tables, cont. Page

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MEASUREMENT UNITS AND NOMENCLATURE

Radioactivity data in this report are expressed in both traditional units (e.g., pCi/L) and International System (abbreviated SI) units. These units are explained below.

background Ambient background radiation to which people are exposed. Naturally occurring radioactive elements contained in the body, in the ground, and in construction materials, cosmic radiation, and radioactivity in the air all contribute to an average radiation dose equivalent to humans of about 350 mrem per year. In laboratory measurements of radioactivity in samples, background is the activity determined when a sample of distilled water is processed through the system (Also called a blank).

becquerel Abbreviation Bq. The Bq is the SI unit for disintegration rate. 1 Bq = 1 disintegration per second.

concentration Activity per unit volume or weight. Usually expressed as µCi/mL, pCi/m^3 or pCi/g.

curie Abbreviation Ci. The historic unit for disintegration rate. 1 Ci = 3.7 x 10^{10} disintegrations per second = 3.7 x 10^{10} Bq. The usual submultiples of Ci are mCi (10^{-3} Ci or one thousandth Ci), µCi (10^{-6} Ci or one millionth Ci), and pCi (10^{-12} or one trillionth Ci).

EDE Effective dose equivalent - radiation dose corrected by various weighting factors that relate dose to the risk of serious effects.

rem Rem (for roentgen equivalent man) is the unit for expressing dose equivalent, or the energy imparted to a person when exposed to radiation. The commonly used subunit is the millirem (10^{-3} rem or one thousandth rem), abbreviated mrem.

roentgen Abbreviation R. A unit expressing the intensity of X or γ radiation at a point in air. The usual unit is mR or 10^{-3} R (one thousandth R).

volume The SI unit for volume is m^3 (cubic meter). Other units used are liter (L) and mL (10^{-3} L or one thousandth liter). One cubic meter = 1,000 L, 1 L = 1.06 quarts.

The elements and corresponding symbols used in this report are:

Element	Symbol	Element	Symbol
Actinium	Ac	Iron	Fe
Aluminum	Al	Krypton	Kr
Argon	Ar	Lead	Pb
Arsenic	As	Lithium	Li
Barium	Ba	Mercury	Hg
Beryllium	Be	Nitrogen	N
Bismuth	Bi	Oxygen	O
Boron	B	Plutonium	Pu
Cadmium	Cd	Potassium	K
Calcium	Ca	Radium	Ra
Cesium	Cs	Radon	Rn
Chlorine	Cl	Selenium	Se
Chromium	Cr	Silver	Ag
Cobalt	Co	Strontium	Sr
Copper	C	Thallium	Tl
Europium	Eu	Thorium	Th
Fluorine	F	Thulium	Tm
Hydrogen	H	Tritium	^3H
Iodine	I	Uranium	U

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LIST OF ACRONYMS AND ABBREVIATIONS

AIP	Agreement in Principle
ANOVA	Analysis of Variance
APCD	Air Pollution Control Division
ARL/SORD	Air Resources Laboratory, Special Operations and Research Division
ASCII	American Standard Code for Information Interchange
ASER	Annual Site Environmental Report
ASL	Analytical Services Laboratory
ASN	Air Surveillance Network
BCG	Biota Concentration Guide
BEIDMS	Bechtel Environmental Integrated Data Management System
BHPS	Bureau of Health Protection Services
BLM	U.S. Bureau of Land Management
BN	Bechtel Nevada
BOD	Biochemical Oxygen Demand
CAA	Clean Air Act
CADD	Corrective Action Decision Document
CAP	Corrective Action Plan
CAP88-PC	Clean Air Package 1988 (EPA software program for estimating doses)
CAU	Corrective Action Unit
CEDE	Committed Effective Dose Equivalent
CEI	Compliance Evaluation Inspection
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CP	Control Point
CRMP	Community Radiation Monitoring Program
CTLP	Community Technical Liaison Program
CWA	Clean Water Act
CX	Categorical Exclusion
CY	Calendar Year
DCG	Derived Concentration Guide
DDR	Data Discrepancy Report
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOE/HQ	DOE Headquarters
DOELAP	DOE Laboratory Accreditation Program
DOE/NV	DOE Nevada Operations Office
DQO	Data Quality Objectives
DRI	Desert Research Institute, University and Community College System, Nevada
EA	Environmental Assessment
EDE	Effective Dose Equivalent
EHS	Extremely Hazardous Substances
EIS	Environmental Impact Statement
ELU	Ecological Landform Unit
EMAC	Ecological Monitoring and Compliance
EML	Environmental Measurements Laboratory (DOE)
EO	Executive Order
EOD	Explosive Ordnance Disposal (NTS)
EODU	Explosive Ordnance Disposal Unit
EPA	U.S. Environmental Protection Agency

EPCRA	Emergency Reporting and Community Right-to-Know Act
ERA	Environmental Resource Associates
ERP	Environmental Restoration Project
ESA	Endangered Species Act
ESHD	Environment, Safety and Health Division
ET	Evapotranspiration
FFACO	Federal Facilities Agreement and Consent Order
FFCAct	Federal Facilities Compliance Act
FIFRA	Federal Insecticide Fungicide and Rodenticide Act
FY	Fiscal Year
GCD	Greater Confinement Disposal
gpm	Gallons per Minute
HSC	Hazardous Materials Spill Center
HTO	Tritiated Water
HWSU	Hazardous Waste Storage Unit
ICRP	International Commission on Radiological Protection
ID	Identification
INEEL	Idaho National Engineering and Environmental Laboratory
IT	International Technology
LANL	Los Alamos National Laboratory
LAO	Los Alamos Operations (BN)
LDR	Land Disposal Restrictions
LLNL	Lawrence Livermore National Laboratory
LLW	Low-Level (Radioactive) Waste
LO	Livermore Operations (BN)
LTHMP	Long-Term Hydrological Monitoring Program
MAPEP	Mixed Analyte Performance Evaluation Program
MDC	Minimum Detectable Concentration
MEI	Maximally Exposed Individual
MOU	Memorandum of Understanding
MQO	Measurement Quality Objectives
MSL	Mean Sea Level
NAC	Nevada Administrative Code
NAFR	Nellis Air Force Range
NAGPRA	Native American Graves Protection and Repatriation Act
NDEP	Nevada Division of Environmental Protection
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NIST	National Institute of Standards and Technology
NLVF	North Las Vegas Facility (BN)
NPDES	National Pollution Discharge Elimination System
NR	National Register
NRHP	National Register of Historic Places
NSHPO	Nevada State Historic Preservation Office
NTS	Nevada Test Site
NVLAP	National Voluntary Laboratory Accreditation Program (NIST)
OEMP	Offsite Environmental Monitoring Program
ORSP	Offsite Radiological Safety Program
P2	Pollution Prevention

PA	Performance Assessment
PCB	Polychlorinated Biphenyl
PE	Performance Evaluation
PEP	Performance Evaluation Program
PES	Performance Evaluation Study
PIC	Pressurized Ion Chamber
PPOA	Pollution Prevention Opportunity Assessments
QA	Quality Assurance
QAP	Quality Assessment Program
RBRC	Rechargeable Battery Recycling Corporation
RCRA	Resource Conservation and Recovery Act
RCT	Radiological Control Technician
R&IE-LV	Radiation & Indoor Environments National Laboratory - Las Vegas (EPA)
RMP	Resource Management Plan
ROD	Record of Decision
RREMP	Routine Radiological Environmental Monitoring Plan
RSD	Relative Standard Deviation
RSL	Remote Sensing Laboratory (BN)
RWMS	Radioactive Waste Management Site
RWMS-3	Radioactive Waste Management Site, Area 3
RWMS-5	Radioactive Waste Management Site, Area 5
SAFER	Streamlined Approach for Environmental Restoration
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
SQL	Structured Query Language
STL	Special Technologies Laboratory (BN)
TaDD	Tactical Demilitarization Development
TLD	Thermoluminescent Dosimeter
TRU	Transuranic Radionuclide
TSCA	Toxic Substances Control Act
TTR	Tonopah Test Range
UGTA	Underground Testing Area
U.S.	United States of America
USFWS	U. S. Fish and Wildlife Service
USES	U. S. Geological Survey
US	Underground Storage Tank
V.C.	Volatile Organic Compound
VIM	Vades Zone Monitoring
WACO	Washington Aerial Measurements Operations (BN)
WE	Waste Examination Facility
WIMP	Waste Isolation Pilot Plant
WI	Work Instructions
WPM-OF	Western Poohed Mesa Oasis Valley

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